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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|-------------------------|---------------------|------------------|
| 10/004,386 | 12/03/2001 | George D. Papasouliotis | M-12019 US | 5934 |

7590 12/24/2003

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EXAMINER

THOMPSON, CRAIG

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2813

DATE MAILED: 12/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/004,386

Applicant(s)

PAPASOULIOTIS ET AL.

Examiner

Craig A. Thompson

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-30 and 35-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 1-4 and 6-30 is/are allowed.
- 6) ☐ Claim(s) 35-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Allowable Subject Matter

ClaimS 1-4, 6-30 are allowed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Papasouliotis (U.S. Patent No. 6,030,881, " '881 ") in view of Perry et al. (U.S. Patent No. 5,705,419, " '419 "). The '881 reference qualifies as prior art for a 35 USC 103 rejection under 35 USC 102(b) because it was published more than a year prior to the current application. "A 35 U.S.C. 103 rejection is based on 35 U.S.C. 102(a), 102(b), 102(e), etc. depending on the type of prior art reference used and its publication or issue date. For instance an obviousness rejection over a U.S. patent which was issued more than 1 year before the filing date of the application is said to be a statutory bar just as if it anticipated the claims under 35 U.S.C. 102(b)." See MPEP 2141.01(I) paragraph 2.

The examiner notes that claim ³⁵ does not require use of a pure hydrogen plasma, accordingly any previous reference that teaches, for instance a hydrogen halogen mixture for plasma etching would render the claims 35-37 obvious over '881.

(CT)

Claim 1 of '881 teaches a process in IC production for filling a gap having an opening of initial width in the surface of the substrate including: depositing a film in the gap using an HDP CVD process having an etch dep ration of 0.02 (less than one), stopping the depositing before the opening closes, etching the film in the gap, stopping etching before the corners of the elements forming the gap are exposed and later depositing a film in the gap and later depositing a film in the gap. '881 expressly teaches using silicon dioxide, an oxide film (column 5, lines 50-65). '881 fails to expressly teach using a hydrogen-plasma chemical etch. Hydrogen plasma etches are well known in the art of semiconductor manufacturing. '419 teaches that the use of a hydrogen plasma (hydrogen bromide) facilitates etching in a partial and controllable manner (see column 5, lines 21-37). The process is expressly taught to prevent formation of stringers (abstract and title). At the time of invention it would have been obvious to one of ordinary skill in the art of semiconductor manufacturing to have modified the process of '881 according to the teachings of '419 and used hydrogen plasma etching as in claims 35-37 of the current invention. The motivation would have been suppression of stringers as expressly taught by '419. With respect to claims 36 and 37 the use of a doped and undoped oxide film is obvious because '881—claim 7 teaches using an undoped silica glass and '881-claim 8 teaches using a doped silica glass.

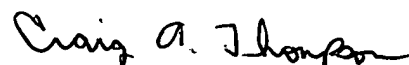
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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig A. Thompson whose telephone number is (703)305-4789. The examiner can normally be reached on Monday-Friday 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on (703)308-4940. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.



Craig A. Thompson
Primary Examiner
Art Unit 2813

22 December 2003